

PROPOSALS

For the more Effectual

DRAINING

All the LEVELS contiguous to the RIVER

WITH A M,

FROM THE

City of LINCOLN to CHAPPLE-HILL,

AND LIKEWISE,

All the FENS and LOW-GROUNDS,
which empty themselves at LODOWICK-GOAT,

And at the same Time,

To restore the almost lost NAVIGATION upon
the said RIVER, to a better STATE than ever it
was; as by a given PLAN.

By DANIEL COPPIN.

Printed in the Year, MDCCXLV.

THE LEAVES OF THREE

第四章 亂世

46
4 3
5.80



PROPOSALS for the more effectual
 Draining all the Levels contiguous to
 the River WITHAM, from the City of
 Lincoln to Chapple-hill, &c.

TO effect which, in a late Survey I have Observed, the most natural Way is, to cut a new River from *Tattershal-Ferry House*, thro' *Billinghay-Dales*, belonging to Lord *Fitzwilliams*, or to enter into *Kime-Eau*, near *Chapple Hill*, twenty Yards Wide at the Top, and eight Feet Deep, which is in length about one Mile to *Kyme-Eau*, near his Lordship's *Fox*; thence thro' a Corner of *Hart's Grounds*, belonging to his Lordship, into *Lodowick Drain*, which Drain, I propose to Widen to about 20 Yards, and eight Feet Deep all the Way to *Lodowick Goat*, and to make Banks four or five Feet High, and twelve or fifteen Yards Distance from the Rivet's Brink as far as *Toft Tunnel*; from thence to *Shuff-Bridge*, the Banks to be contracted to ten Yards of the said River's Brink; from thence, the Banks to be contracted Gradually, 'till it come to a Point at *Lodowick Goat*; at which *Goat*, I propose to make a Grand Sluice, which, when Open, will Discharge as much Water as the full Run of River can Produce; by which Sluice, I propose to Stop the Sea from getting into the new made River: Now, as *Toft Tunnel*, and *Shuff-Bridge*, must both be taken up, two other Bridges must be Erected in the same Places, and

a Bridle Way over the Sluice ; the Charges of all the aforesaid Works to be born by the Lands so drained ; but as all these Lands mentioned, have small Drains, Sykes, and Ditches, that may want Cleansing, in order to Convey their superfluous Waters into the said River, I propose all the Lands above *Chapple-Hill* to Cleanse their own, exclusive of the Fens, which Fens, having many Funnels to be laid under the Banks, the Charges thereof I propose to be laid to them alone.

From what has been said, it is easy to Perceive, that by cutting off above twenty Miles of the winding Parts of the River **W I T H A M**, and causing the Waters to run in almost a direct Line thro' a deep Channel, and about twelve Miles nearer :

That all the Land Floods that shall happen, will run with a much greater Velocity, and sooner discharge themselves into the Sea, than ever they did when the River **W I T H A M** was in its best State.

Before I enter upon the second Part of my Proposals, which is to Restore *Navigation* upon the said River to a better State than ever it was, I must first take Notice of a general received Maxim, that Draining and *Navigation* are Contradictions to each other : Which Maxim, I hope to make appear is not always true, and especially in the Case before us, but contrarily will prove, that what is absolutely necessary for *Navigation*, is also as necessary for those Lands which are to be Drained ; for I believe it will be Granted, that when those Lands are Drained, the Land-holders would preserve as much Water as they can in their Ditches for the Use of their Cattle, &c. Now, if by fixing

Stanches

Stanches in proper Places, as shewed in the Plan, we can hold up the Waters in the River to what Height is required, which is necessary to do in a dry Season for Navigation, even so it will give the Land-holders and Fen-holders an Opportunity to take in what Quantity of Water they require into their Drains, Ditches, and Sykes, by opening the drop Doors of their Funnels for the aforesaid Uses; so far it appears, Draining and Navigation agree.

In order to restore Navigation to a better State than ever, I propose in the first Place, to cut a Channel near the grand Sluice from the Haven, into the new made River, where I fix a double Lock as in the Plan, having a Pen about forty Yards in Length, thro' which Boats may pass and re-paſs every Day: Now, by looking into the Plans, it is easy to see this Lock is no Obſtruction to Draining at all: In the next Place, before I fix my Stanches, it is necessary to explain what I mean thereby, for I believe many of the Land Owners in this Country never ſaw any, and ſo might be apt to ſuspect they would be an Obſtruction to Draining; now, Stanches in ſome Places are call'd loose Pens, which hold up the Water in a dry Time, and made to open and shut like the Gates of the Lock, for the Paſſage of Boats: Now, I design these to be of no Uſe in a Wet Seafon, but to be taken off and laid by 'till wanted again, and that nothing of them remain in the River, but the upright Posts to which they are Fastened.

From the neicest Observations I have taken of Mr. Grundy's Levels, I find he makes the Surface of the Land at *Tatterſhall Ferry House*, to be four Feet $\frac{2}{3}$ Inches higher

than the Surface of Land at the Grand Sluice, which Sluice will be sufficient to supply the new made River to the aforesaid *Ferry-House*, where I propose to fix my first Stanch, which Stanch will be sufficient to hold up Navigable Water, as far as the Shoals against *Monk's Ground*, within two Miles of *Lincoln*, where I propose to fix another, as appears in the Plan; the Surface of the Ground, at which Point by the said Levels, I find to be four Feet ten Inches, the Distance of Places is twenty four Miles.

Now, if I allow but one Inch Rise in a Mile for the least Current, the Distance of the Places will gain two Feet; but I have Reason to believe from my own Observations, which I have made many Years, that the Current is generally so Strong, that we may allow two Inches and a half a Mile at a Medium, which will be sufficient for our Purpose, and this last Stanch will hold up the Water to carry Vessels to *Lincoln Bridge*, if the Bottom of the River betwixt the Walls be taken out two Feet from *High-Bridge* to *Stamp-End*, which is about a Quarter of a Mile; likewise the Bottoms of several other Shoals to be taken out two Feet at a Medium, *viz.*

	<i>Length of Way.</i>	
	<i>M.Pts Yds</i>	
Betwixt the Walls in the City	—	○ 1 000
Against <i>Monk's Ground</i>	—	○ 3 000
Sand Hills against <i>Foskerton</i>		○ 0 050
<i>Hurton-Hills</i> against <i>Mettams</i>		○ 0 050
<i>Barley-mouth Reach</i>		○ 0 200
		<i>Bardney</i>

	—	—	Length of Way.		
			M.	Pts	Yds
Bardney Shoals	—	—	0	0	150
Bodican Shoals	—	—	0	0	200
Hairbooth	—	—	0	0	200
Rockray Wath.	—	—	0	0	050

Now, as it appears by the Plan, that a Part of the Highway called *Butt lane*, must be taken in, and a Bridle Way made over the new Cut, (But Lord *Fitzwilliams's* Pasture, and a part of Mr. *Brittain's* Pasture must be purchased) I propose a House to be built upon the Spot, for the Man to dwell in, who is to be chosen by the Commissioners of *Sewers*, with the Approbation of the Corporation, to give a constant Attendance both to the Lock and Sluice, the Doors of which Sluice are to be drawn up by a Crain, upon any emergent Occasion, to give a full run of River, and the whole covered by a Shed; the Man, besides his Dwelling-house, to have a Salary of *Ten Pounds a Year*, one Half paid by the Country, and the other Half by the Corporation.

Also, the Commissioners of *Sewers* shall choose two Men out of the Country, who shall jointly, with two others, chosen by the Corporation, be Inspectors and Directors over the Man's Management, who shall be liable to be turned out upon any just Complaint, and another chose in his room.

By this it appears, all their Lands in a wet Season may be Drained, and made Years Lands, and in a dry Season may be furnished with plenty of Fresh Water, and for Navigation,

vigation, nothing but a Frost can hinder them from Navigating from *Boston* to *Lincoln* every Day in the Year.

Now, it is necessary to know, when there is a sufficient Quantity of Water let off, which cannot be done by any Mathematical Rule, but by Observation; I have made it my constant Practice every Year, to Travel from *Boston* to *Lincoln*, for twenty Years past, and always by the River Way, which has given me Opportunities to make all Observations necessary in this Affair, and makes me offer myself to Instruct any Person so employed.

Lands contiguous to be Drained, as follows.

	Acres.	L.	S.	D.
To Land Estates on the South and West-side the River,	27000			
To Land Estates on the North and East-side the River,	5652			
Total	32652			
The Whole at 3 s. per Acre, raised		4897	16	0
The Fen Land	24000			
Levied at the same Rate		3600	0	0
Total of both		8497	16	0
The Charge upon the Country amounts to		8170	13	6
The Charge upon the Corporation		2562	1	9
The whole Charge, as appears by the following Estimates,		10732	15	3

An ESTIMATE of the *Expence* of the
Fore-mentioned Works, by **WILLIAM**
JACKSON.

For the COUNTRY.

L. S. D.

To Erecting the Grand Sluice of 65 Feet
in Breadth, containing 17 able Standards of
Oak, 2 by 1 Feet Square, to be 3 Feet
asunder for the opening the Water-way, with
Gates to be drawn up by a Crane, to fall
9 Feet high, or any lesser Height, as Occa-
sion may require, to be made of good 4
Inch Oak Plank, the Whole to be Framed, as
expressed in the Design, and fix the whole
Framing, and to pile that Part, and jet and
fend the Banks on both sides the Gates, with
a Crain Erected to draw up the Gates, as
Necessity may require, and a Shed overall. 2680 0 0

To cutting the intended new River to
the Width of 60 Feet, as proposed, being
about 9 Miles, and 2112 Floors in a Mile,
at 4*s. per Floor.* 3801 12 0

To Erecting 2 Bridges of Timber for
Carriages, and one Bridge for a Horse-way. 500 0 0

Carried over 6981 12 0

To

	L.	S. D.
Brought over	6981	12 0
To the new Cut thro' <i>Billinghay Dales</i> , to <i>Tattershal-Ferry-House</i> , as proposed, about a Mile.	800	0 0
To the Supervising this Part of the Work, and other Incident Charges.	389	1 6
Total	8170	13 6

I have Charged nothing for Cutting thro' *Billinghay-Dales*, belonging to Lord *Fitzwilliams*, for when I surveyed it, it was two Feet under Water, at the same Time *Billinghay Fen* and *Holland Fen*, contiguous to it, were both dry Land, and Cattle Grazing on them, by which I Observed, that *Billinghay Dales* was the Receptacle of all the upper Waters; and as I admit the old River to come into *Lodowick Drain* by *Kyme Eau*, jointly with the new Cut, there is Reason to Believe the Benefit those Dales will receive, will a great deal more than Balance the Loss of so much Land, as the new Cut will contain, for which Reasons, I leave it to his Lordship's Discretion.

For

[9]

For the CORPORATION.

L. S. D.

To Erecting the Double Lock and Pen of Free-stone, for the side Walls and Wings, and backed with Bricks, to be 16 Feet Wide and 40 Yards Long in the Clear, and to dig out the new Cut, and to Jet and Fend it next the Haven

1466 0 0

560 0 0

100 0 0

To Erecting 2 Stanches, as Proposed
To taking out the Bottoms between the City Walls

199 16 0

To taking out all the other Bottoms 2 Feet Deep, and 20 Feet Broad as mentioned, containing 666 Floors, at 6 s. per Floor

116 5 9

To supervising this Part of the Work and other Incident Charges
To Erecting a House, and purchasing Lands, where the Lock is to be placed.

120 0 0

Total 2562 1 9

To be advanced by the Corporation, for which they may receive such a Toll, as will be thought Reasonable, not exceeding 12 d. per Tun for some certain Time, after which Time is expired, the Toll to be contracted to a less Sum for Repairs, Salaries, &c.

F I N I S.

APPENDIX.

PERUSING what I have Wrote, I thought I had made Provision against all Objections of Weight, that might be brought to my Scheme of Draining and Navigating thro' *Holland-Fen*, but finding in a printed Book, sign'd, *John Grundy, Senior, and Junior*, some Arguments laid down, insinuating, my Scheme ought to be rejected; but as I find those Arguments are not Mathematical, I shall take Notice but of Two.

Page 43. *First*, That *Holland-Fen* is higher than *Wildmore Fen* by one Foot nine Inches, Granted; and if it 'twas higher still, I should like it better, for it is but digging so much deeper, and we shall have so much more solid Earth, and less Banks to contain our Waters. *Secondly*, That it will require a very large strong Lock and side Doors, surely he does not lay

Page 20. this down for an Objection, for in his Seventeenth Theorem, he seems to allow the River *W I T H A M* to be near an Horizontal Plain, and that the Tides ought to be stem'd in such a River; if so, he should have assign'd a proper Place, where such a Lock and Sluice ought to be fix'd.

Page 42. The Reason he gives for not fixing a Lock at *Anthony's-Goat*, is, that it would be too near the Out-fall; had he said it would be too far off, I should have Agreed with him, for natural Reason tells me, the less Way, the Sea carries Silt up a River, the less Way will the Freshes have to scour it out again, and Experience has shown us, that a rapid Spring Tide, having its free Course, tears up the sand at the

River's

River's Mouth, carries it up into the higher Part, where it is Narrow and Crooked, and there leaves it for the next Land Floods to drive out again, which is never done, 'till the Lands above are under Water. For which Reason, if Circumstances of Place would admit, I would chuse to fix a Lock and Sluice within a Mile of the Sea, for as all the Waters which fall into the River *W I T H A M*, would gradually come down to our Sluice, the River at that Place, being one Quarter of a Mile Broad, we should always have it in our Power to keep up a large Quantity of fresh Water in the driest time that should happen: But as Circumstance of Place will not admit to come nearer than *Lodowick-Goat*, so the fixing a Lock and Sluice at that Place will be best adapted for the Benefit of the Fen-holders, in taking in what Quantity of Fresh Water is required for the Use of their Stock.

As *John Grundy, Senior, or Junior*, has taken the Liberty to Censure my Scheme, I shall take the same in making a few Observations on his:

First, I Observe, he has not told us in his Book, (what I expected to have seen) the difference between the Bottom of the old River, and the Top of *Wildmore-Fen*, for I have been told, that when he took his Levels, he declared he found one Part of the Fen to be five Feet Lower than the Bottom of the River; when I heard that, I answered, I had made the like Observation two Years before, and found it to be four Feet Lower, and now coming over the same Fen, *September, 1744*, I found the same difference in more Parts than one.

All which, if true, and that according to his first Page 23. Scheme,

Scheme, the old River ought to be dug five Feet Deeper; he should have told us, that since the Land in those Parts, are near as Low as his new River ought to be, how he designs to make his Banks, and where he'll get his Earth for them; and as he designs them Sea Banks, should have ascertained the Height and Breadth, and who must be at the Expence of maintaining them, that the Proprietors of the Fens might judge for themselves, for it is to be thought, they will require stronger Security than all his *Theorems*, tho' they were twice the Number.

After all, should he be employed, and get Earth enough, either from *Keal-hill*, or by cutting two new Rivers, one on each side his Grand River, for the sake of the Earth to be added to his Banks and compleat his Works to *Anthony's Goat*; when he Cuts the Haven Bank in Order to discharge his Waters, looking towards the River, there will appear to his View, these large Characters, *Ne plus Ultra*, the English of which is, the bottom of the River in those Parts, is higher than the Land Floods, and here he'll have three Miles three Quarters of the Haven to digg by his own Account, which cannot be done without stopping the Sea.

However, if the Freshes cannot get into the Haven, the Salt Water will get into his new Cutt, and make it a proper Reservoir.

Secondly, In making his grand River, he cuts the Fen in two, and by a Cut from *Langerick-Goat*, he makes another Division; surely the Fen is not to be cut into Islands, but in Order to be joined together again, either by Bridges or Ferries; if by Bridges, he, extending the Banks of his River above forty Yards asunder, and being

an *Engineer*, (as he calls himself) ought to have drawn a Plan of such a Bridge, as the Place requires, not forgetting that large Vessels must go under it at high Spring Tides, and likewise calculated the Expence of such a Bridge, and how many the Inhabitants would require; for one only, will not serve their End; but it's likely he can give his Reasons, for not bringing Bridges into his Scheme, as he did for not fixing a Lock.

One Observation more, and I have done; he tells us his Page 30. Stanches will be of great Service in keeping up the Waters above in dry Seasons, both for Navigation and the Use of Stock. Now I would know, whether the Water so kept up will be Salt or Fresh, for as he admits the Sea to have its free Course, a high Spring Tide in a dry Time, meeting with no Freshes to Stem it, will certainly run a long Way farther than his first Stanch, if not quite beyond his Second, which he fixes about *Longwood-End*, (as I find by looking into his Map) the Page 25. return of which Tide, being stopped by his Stanches, will I grant be of good Service to Navigation, but of what Use it will be to Stock, I'll leave to the Land-holders to Judge.

And now I'll take my Leave of *John Grundy* with two *Distinctions*, *Sen.* and *Jun.* freely granting, that as they were first employ'd, so they were the First that bid Fairest for the one Page 48. best Way at coming at such Truths in Question. But as I was next Employed, and no body since, I humbly hope they will allow Me to be the Second.

DANIEL COPPIN.

